Dec 9 (Last Lecture)

Outline:
Homework 3
Review for final

Final:
Open Book / Note
No computer

HW 3:

Error: Transport Endpoint not Connected = Program Crashed!
Solution: Run Debugger

Cmd: gdb 2.5600-hw3
run -d <image_file> <directory>

Error: I/O error on read
Translation error between Linux and our file system
Solution: If dirent_mode / dirent in this S_IFDIR

struct dirent{entry *fat = malloc
read_block(#, fat + i * 1024)
This is just wrong.
Cast pointer to (char*) before changing the pointer
Reviews for Final:

Basic OS concepts:
- memory maps / I/O
- interface (system calls) - privileged/non-priv mode
- loading and context switch
  - HW1
  - Use stack to represent context
- synchronization - will be questions
  - Classic Problems
  - Reader / Writer
  - Using Monitor to create solution
  - Simpler version of midterm problem
- Guidelines:
  1. Don't trust global variables
     across (threads a unit)
    \[
    \text{(Don't expect)} \quad \begin{cases}
    \text{count++} \\
    \text{unit()}
    \end{cases}
    \text{if (count == 1)}...
    \text{the same}
    \text{Use local variables:}
\]

Good Practice
- total ++
- myTotal = total
- mutex (unlock)

2. Don't Busy wait
   while (kvar < 2)
Task 1
  \[ \text{var}++ \]
  \[ \text{if var} > 2 \]
  \[ \text{signal}(c) \]

Task 2
  \[ \text{if val} < 2 \]
  \[ \text{wait}(c) \]

3. Picture the monitor states

   \[ \rightarrow \]
   \[ \{ \]
   \[ \text{program execution} \]
   \[ \rightarrow \text{wait} \]
   \[ \{ \]
   \[ \text{wait} \]
   \[ \} \]
   \[ \text{Look all conditions possible} \]

   \[ \text{if busy} \]
   \[ \text{wait}(c) \]
   \[ \text{busy} = T \]
   \[ \text{something} \]
   \[ \text{busy} = F \]
   \[ \text{signal}(c) \]

   \[ \text{count}++ \]
   \[ \text{if count} \leq 3 \]
   \[ \text{wait}(c) \]

   \[ \text{else} \]
   \[ \text{broadcast}(c) \]

   \[ \text{II Allow 3 at a time} \]
Virtual Memory
- mechanism: page tables + TLB,
- format, runtime operation
- policy: error, allocate, demand load
- copy-on-write

Hardware Virtualization
- Won't be in Final

Black Devices and I/O
- Disk Drives
- Avoid sleeps
- DMA, drivers, interrupts

 RAID 0

1. Permissions
2. File System
3. Synchronization